

VARIATION IN THE WHITE-TAILED BLACK COCKATOO

By IVAN C. CARNABY, Wooroloo.

In 1933, in my paper on the birdlife of the Lake Grace district (*The Emu*, vol. 33, p. 106), I suggested that the local form of the White-tailed Black Cockatoo (*Calyptorhynchus baudinii*), inhabiting the sandplain and mallee areas, was subspecifically separable from the bird living in the red gum forest country of the South-west corner. The differences related to the form of the bill, the Lake Grace bird having a massive broad bill, distinguishable at a glance from the narrower-billed South-west form. I had intended at the time to name the mallee bird as a new subspecies but on the advice of ornithological consultants withdrew the proposal. As a matter of fact there were at the time no specimens of this robust-billed type in local collections, including the Western Australian Museum.

Recently Dr. D. L. Serventy has drawn my attention to a passage in Gregory Mathews' *Birds of Australia*, vol. 6, 1917, p. 136, where I became aware that Mathews had as early as 1913 anticipated me, but owing to his imperfect knowledge of local geography he not only mis-fired nomenclaturally but later abandoned the idea of the existence of two valid subspecies.

Mathews' remarks were: "The very restricted range of this species is conducive to no subspecific forms. I separated an inland form, as the specimens had very strikingly narrow bills, but I have since received coastal birds showing nearly the same bill formation. In consonance with the conservative policy I have adopted in this work, I am not admitting the inland form as a distinct subspecies. It must be emphasised, however, that this non-recognition does not dismiss the idea of an inland subspecies altogether, but only for the time being, with the material available. Further collections may prove the existence of the narrow-billed inland form, and that my coastal specimens are simply erratic occurrences due to the movements of the species."

The "inland form" of which he speaks was *C. b. tenuirostris* which he described from Wandering in 1913 (*Austral Avian Record*, vol. 1, p. 190). But Wandering is in the heavy forest belt of the South-west, a township 60 miles east of Cape Bouvard, and a locality well within the range of the narrow-billed form as I understand the position. I do not know where Mathews' other material came from, but his broad-billed birds, and which he considered to be "coastal," must undoubtedly have come from east of the big timber belt.

Mathews had completely reversed the situation: the broad-billed birds were not "coastal" in the sense that they occurred along the coastal fringe of the South-west corner—they inhabit, as I have said, the mallee and sandplain country to the eastward of the

jarrah and red gum belt. East of Albany this mallee and sand-plain zone does extend to the coast. On the other hand the "coastal" birds with narrow bills, which Mathews refers to, most likely came from the coastal strip between Perth and Albany, and these would be quite similar to those from Wandering.

Where the original specimen came from, on which Lear founded the species *baudinii* in 1832, is not certainly known, but Mathews has designated Albany as the type locality. At any rate, whether Albany or not it is extremely unlikely that it came from the area of occurrence of the robust-billed form. Thus both names, *baudinii* and *tenuirostris*, are synonymous and applicable to the South-west narrow-billed race and the broad-billed form still awaits proper designation. I propose, therefore, describing it as:

Calyptorhynchus baudinii latirostris, subsp. nov.

Differs from *C. b. baudinii* in having the bill shorter and broader, with the width at the base more than half of the length of the culmen. In *C. b. baudinii* the width is less than half the length of the culmen.

Type: No. A6463, Western Australian Museum; ♂ adult; Hopetoun, Western Australia, collected March, 1948.

There are now two specimens of *C. b. latirostris* in the W.A. Museum, both from Hopetoun, but I have been able to procure measurements of the bills of seven additional specimens from Esperance—from heads of birds shot at Mr. F. W. Bow's pine plantation. Of the *baudinii* form I have measurements of nine specimens from the W.A. Museum. In the following table the specimens are arranged in the order of the relative broadness of their bills. The last column, "culmen/width ratio," is obtained by dividing the length of the culmen (measured from the tip to the cere) by the width of the upper bill (measured at the base). Measurements are in millimetres.

Specimen	Locality	Culmen	Width	$\frac{\text{Culmen}}{\text{width}}$ ratio
<i>C. b. baudinii</i>				
A1927	Moir Pass, Stirling Range.	56.7	22.5	2.52
0322	Augusta.	56.4	22.9	2.46
11398	King River, Albany.	54.0	22.0	2.45
A598	Near Mammoth Cave.	46.2	18.9	2.44
A4717	West Midland.	42.7	21.3	2.24
A1924	Momgup Pass, Stirling Range.	45.6	22.6	2.02
A1926	"	47.2	23.7	1.99
A1925	"	47.0	23.6	1.99
A1923	"	44.0	22.3	1.97

C. b. latirostris

—	Esperance.	45.1	23.1	1.95
—	„	43.6	22.8	1.91
—	„	45.1	23.7	1.90
—	„	45.1	23.7	1.90
A6400	Hopetoun.	42.5	22.6	1.88
A6463 (type)	„	43.8	23.4	1.87
—	Esperance.	40.7	22.0	1.85
—	„	43.6	23.9	1.82
—	„	43.3	24.1	1.80

It will be seen that the robustness of the bill of *latirostris*, and its low culmen/width ratio, is achieved both by an increase in width (average 23.3 mm., compared with 22.2 mm. in *baudinii*) and a decrease in culmen length (average 43.6 mm., compared with 48.9 mm. in *baudinii*), the latter being the more important factor.

As might be expected from their geographical location most of the specimens from the Stirling Range area, though referable to the nominate South-west race *baudinii*, show a trend towards *latirostris* and may be regarded as transitional. The mean of the culmen/width ratio of the Hopetoun and Esperance specimens of *latirostris* is 1.88; the mean of the four truly South-west specimens of *baudinii* (West Midland, Mammoth Cave, Augusta and King River) is 2.40, and the mean of all the Stirling Range skins is 2.10.

Ecology

It is clear that the differences in the form of the beak have been evolved in consequence of the differences in feeding habits. As I pointed out in my 1933 paper the food of the nominate race *baudinii* consists of the seeds of red gum (*Eucalyptus calophylla*) which the bird obtains by picking them out of the capsules with its long thin bill. The mallee form, *latirostris*, feeds mostly on the large hard nuts of *Banksia* and of large *Hakea* which it has to break open with its sturdy bill.

C. b. latirostris at Lake Grace nests in hollows of salmon gums, 8-30 feet high. The nest site is in hollow tree trunks four to eight feet deep and from nine inches to a foot wide. Generally a tree is chosen in a patch of timber close to sandplain. Eggs are generally laid towards the middle of September, but I once found a clutch on August 17. One or two eggs are laid to a clutch. On September 18, 1929 I found a nest with one egg. I returned four days later to photograph the bird at the entrance to the hollow but no bird appeared. I climbed the tree and collected the egg, in which incubation had just commenced. It measured 54 x 35 mm., was dull white in colour and of rather coarse texture. On October 20 the birds had another nest about 300 yards from the first one. The eggs had just hatched out.